

## APPENDIX 13.3-A

### COMMONLY USED INDOOR ANTIMICROBIAL PRODUCTS

Antimicrobial <sup>1</sup>	Action <sup>2</sup>	Advantages	Disadvantages
Alcohols	B, F, V	non-staining; not irritating; non-corrosive	inactivated by organic matter; highly flammable; not effective against spores
Aldehydes (formaldehyde)	B, F, V, S**	inexpensive; not affected by organics	irritating; slow penetration rate; toxic
Chlorine dioxide			Extremely toxic; not recommended for treating occupied areas
Gluteraldehydes;	B, F, V, S**	not affected by organics; not corrosive; less toxic than aldehyde	irritating; expensive; slow penetration
Hydrogen peroxide	B, F, V, S**	stable at low concentrations	corrosive; degrades in heat and ultraviolet light; expensive
Hypochlorites (bleach)	B, F, V, S**	inexpensive	toxic; corrosive; inactivated by organic matter; removes color from fabrics; dissolves protein fibers (wool, silk); NEVER mix with ammoniated detergent (releases chlorine gas)
Iodophors (iodine compounds)	B, F, V, S**	stable; residual action	inactivated by organic matter; expensive; irritating
Ozone			Extremely toxic; not recommended for treating occupied areas
Phenolics	B, F, V	inexpensive; residual action; considered effective against vegetative (growing) bacteria and fungi	toxic; irritating; corrosive; not effective against spores
Quaternary Ammonia Compounds	B*, F, V*	inexpensive; relatively non-toxic; odorless; non-corrosive; stable	inactivated by organic matter; limited efficacy; not considered sporicidal

<sup>1</sup> The Environmental Protection Agency (EPA) registers and regulates antimicrobial pesticides under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). To obtain registration, manufacturers of antimicrobial products must meet the basic standards, the foremost being: 1) that the product will not cause unreasonable adverse effects to human health or the environment, and 2) that product labeling and composition comply with the requirements of FIFRA. Full details on antimicrobial registration, labeling, and data requirements are in 40 CFR Parts 152, 156, and 158.

<sup>2</sup> **ACTION Key**    B = bactericide                      S = sporicide  
                              F = fungicide                        \*    Limited effectiveness  
                              V = virucide                                \*\* Requires prolonged contact time

In general, antimicrobial pesticides are divided into two categories based on the type of microbial pest against which the product works:

Non-public health products are used to control growth of algae, odor-causing bacteria, bacteria which cause spoilage, deterioration or fouling of materials, and microorganisms infectious only to animals. This general category includes products used in cooling towers, jet fuel, paints, and treatments for textile and paper products.

Public health products are intended to control microorganisms infectious to humans in any inanimate environment. The more commonly used public health antimicrobial products include antiseptics/germicides, disinfectants, sanitizers, and sterilizers. This category also includes those products that act as preserving agents in paints, metalworking fluids, wood supports, or other products to prevent their deterioration.

Antiseptics and Germicides: Used to prevent infection and decay by inhibiting the growth of microorganisms. Because these products are used in or on living humans or animals, they are considered drugs and are thus approved and regulated by the Food and Drug Administration (FDA).

Disinfectant: One of three groups of antimicrobials registered by EPA for public health uses. EPA considers an antimicrobial to be a disinfectant when it destroys or irreversibly inactivates infectious or other undesirable organisms, but not necessarily their spores. EPA registers three types of disinfectant products based upon submitted efficacy data: limited, general or broad spectrum, and hospital disinfectant.

Sanitizer: One of three groups of antimicrobials registered by EPA for public health uses. EPA considers an antimicrobial to be a sanitizer when it reduces but does not necessarily eliminate all the microorganisms on a treated surface. To be a registered sanitizer, the test results for a product must show a reduction of at least 99.9% in the number of each test microorganism over the parallel control.

Sterilizer (aka Sporicide): One of three groups of antimicrobials registered by EPA for public health uses. EPA considers an antimicrobial to be a sterilizer when it destroys or eliminates all forms of bacteria, fungi, viruses, and their spores. Because spores are considered the most difficult form of a microorganism to destroy, EPA considers the term sporicide to be synonymous with "sterilizer."